

# COST *and* MANAGEMENT

VOL. XXVI

FEBRUARY

NO. 2

## ECONOMIC MANAGEMENT OF INVENTORIES

By Raymond L. Bowles

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Mr. Bowles is a native of Springfield, Mass. After graduating from Massachusetts Institute of Technology he joined the Armstrong Cork Co., as an industrial engineer. His original approach to the problems of inventory control led to the establishment of a separate department to administer this function for the company as a whole. He is now manager of this division which is known as the Production Planning Department. Mr. Bowles' paper has been made available to Cost and Management through the courtesy of the National Association of Cost Accountants.

## MANAGEMENT OF TOMORROW'S BUSINESS TODAY

By C. B. Taylor

65

Mr. C. B. Taylor has been established as a Cost Consultant in Toronto since 1934. His earlier employment was with Hayes Steel Products Limited, as Factory Manager. He is at present Secretary-Treasurer of the Canadian Institute of Stove and Furnace Manufacturers, Managing Director of the National Warm Air Heating & Air Conditioning Association and a member of both the Certified Public Accountants Society and the Society of Industrial and Cost Accountants.

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# SOCIETY NOTES

## NOTICE OF EXAMINATION DATES

The dates for the 1952 Examinations have been set as follows:—

Fundamentals of Cost Accounting .....	Monday, April 21st
Accounting I .....	Tuesday, April 22nd
Advanced Cost Accounting Paper I) .....	Wednesday, April 23rd
Accounting II .....	Thursday, April 24th
Industrial Organization and Management .....	Friday, April 25th
Advanced Cost Accounting (Paper II) .....	Saturday, April 26th
Business Mathematics .....	Monday, April 28th
Industrial Legislation .....	Tuesday, April 29th

Application forms may be obtained from the Registrars of the Provincial Societies as follows:—

Alberta — Mr. N. S. Howe, P.O. Box 4038, South Edmonton, Alberta.

British Columbia — Mr. C. H. Davis, R.I.A., 2391 Burrard St., Vancouver 9, B.C.

Manitoba — Mr. A. E. Godsmark, 611 Confederation Life Bldg., Winnipeg, Manitoba.

New Brunswick — Mr. Ralph B. Fullerton, R.I.A., Enamel & Heating Products Ltd., Saskville, N.B.

Nova Scotia — Mr. R. F. Hatfield, R.I.A., Highways Department, Provincial Building, Halifax, N.S.

Ontario — Mr. J. N. Allan, R.I.A., 66 King St. E., Hamilton, Ontario.

Quebec — Mr. K. S. Wilson, 507 University Tower Bldg., 660 St. Catherine St. W., Montreal, Quebec.

Saskatchewan — Mr. Gordon Frith, R.I.A., Saskatoon, City Hospital, Saskatoon, Saskatchewan.

# CHAPTER NOTES

## FERNIE TROPHY STANDING

The Ottawa Chapter is setting the pace for the Fernie Trophy with a 58% point increase in membership which is in keeping with a remarkably successful year it is enjoying in all respects.

The following are the Chapter standings for the Fernie Trophy as at January 31st:—

Mem.					
April 30th, 1951					
	Basic Points	Senior Members	Student Members	Points Increase	Percentage Increase
Ottawa .....	100	22	14	58	58
Victoria .....	46	—	26	26	56.5
Saskatoon .....	55	—	26	26	47.2
Regina-					
Moose Jaw ....	82	—1	35	33	40.2
Vancouver .....	254	11	63	85	33.4
Eastern					
Townships ....	63	2	17	21	33.3
Calgary .....	194	1	61	63	32.5
Kent County ....	44	6	—	12	27.3
Edmonton .....	167	2	39	43	25.7
Hamilton .....	411	26	43	95	23.1
London .....	110	14	—3	25	22.7
Kitchener .....	122	5	16	26	21.3
Toronto .....	521	26	36	88	16.8
Moncton .....	43	3	1	7	16.2
Kingston .....	57	2	5	9	15.8
Niagara .....	122	7	3	17	13.9
Peterborough ....	74	4	1	9	12.3
Windsor .....	168	5	9	19	11.3
Halifax .....	183	3	13	19	10.3
Montreal .....	574	6	19	31	5.4
St. Maurice					
Valley .....	82	2	—	4	4.9
Lethbridge .....	31	—	1	1	3.2
Winnipeg .....	170	2	—3	3	1.8
St. John .....	66	1	—1	1	1.5
Bay of Quinte ..	40	3	—6	—	0.0
Quebec .....	197	5	—11	—1	—5
Fort William-					
Port Arthur ...	173	—4	—2	—10	—5.8

## New Members

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Richard C. Jones, 1435 - 7th Ave. N.W.  
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H. L. Mackenzie, 2131 - 22nd Ave. S.W.  
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Adolf Renne, Central Alberta Sanatorium  
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Steve M. Berke, 319 - 5th Ave. W.  
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L. J. Blanchfield, 1625 - 13th Ave. W.  
Herrick Bosworth, 919 - 21st Ave. N.W.  
A. J. Carlson, 1110 - 21st Ave. N.W.  
G. R. Cooley, 1707 Bowness Rd.  
D. R. Craig, 835 - 13th Ave. W.  
D. A. Davis, 317 - 9 A St. N.W.  
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Richard Epton, 2232 Broadview Rd.  
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Arnold Fry, 1324 - 13th Ave. W.  
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## Chapter Notes

### HAMILTON CHAPTER

Speaking at the January meeting of the Hamilton Chapter, Professor Kenneth S. Byrd, M.A., of McGill University, urged the accounting profession to consider the devising of a uniform practical method to disclose the effect of inflationary factors on corporate profits. Since the present inflationary trend showed no immediate signs of stopping, the speaker stated this condition was causing grave concern among industrialists with respect to retaining the actual productiveness of invested capital in a prolonged period of falling dollar values.

The speaker outlined the attitudes of the accounting profession in the United States and Great Britain, where the professional accounting bodies were opposed in principle to the revaluation of assets to current replacement values.

The speaker also discussed the current practice in France and Belgium where taxation authorities do allow corporations to convert different classifications of assets to current values based on a published government price index.

Professor Byrd was introduced by City Finance Commissioner R. J. Menary, and a vote of thanks was moved by C. Thomas.

Mr. J. N. Allan gave a brief report of his recent trip to the Maritimes and the Western Provinces. Mr. Allan's report was most gratifying with respect to the accomplishments of the past, however continued vigilance and hard work would be required in the future to maintain the high standards of the Society and to consolidate its position in the accounting profession.

### LONDON CHAPTER

The regular monthly meeting of the London Chapter of this Society was held at the Y.M.C.A., on January 24th. This was a dinner meeting and 55 members and guests were present for the meal and many others came later to hear the very interesting talk which was given by Professor E. A. Allcut, Department of Mechanical Engineering, University of Toronto.

Professor Allcut chose to speak on the subject: "Some Aspects of Business Administration". Those present heard an outstanding speaker and he was thoroughly enjoyed by all. To those who were unable to attend — you missed something worthwhile.

The speaker was introduced by Reg Diwell, Firestone Tire & Rubber Company, Ltd., Woodstock, and thanked by Stan Nadorozny.

Alex Moorhouse, Chapter chairman, was in charge of the meeting and told the gathering of the formation of the student study group meetings now being held on Tuesday of each week. We are indebted to Norman Duncan, R.I.A., as he has spared no effort to bring the students together for their mutual benefit. Nice work, Norman.

Student discussion group meets every Tuesday evening, at 7.30 p.m.

Meeting place: London Air Force Association, 330B Dundas Street, London.

Out-of-town students will be very welcome.

## MONCTON CHAPTER

The second mixed annual dinner of the Moncton Chapter of the New Brunswick Society of Industrial & Cost Accountants was held at Dunham's on Tuesday night.

The main feature of the dinner meeting was a talk by Magistrate W. F. Lane entitled "Wit and Humour". The magistrate illustrated his talk with many situations which gave rise to jocularity. The speaker pointed out that despite the woes of mankind, he, fortunately, found time to laugh a little. Mr. Lane expressed the opinion that an appreciation of wit and humour was a characteristic of democracy and that it was an essential part of a full life.

Magistrate Lane was introduced by Paul Magee and thanked by Fred DeVinney. The chairman of the evening was the president of the Moncton Chapter, Robert Hunter.

Further entertainment of the members and guests was provided in the singing of the Moncton High School Sextette. Several popular, new and old songs were presented and heartily applauded.

## TORONTO CHAPTER

The January meeting of the Toronto Chapter was the occasion of our Annual Student Night and was held on January 10th at the Oak Room of the Union Station under the direction of the students headed by A. Oakie, their chairman.

The guest speaker, Mr. L. C. Bonnycastle, F.S.A., general manager, National Life Assurance Co. of Canada, spoke on the subject "An Organization Program". The speaker's talk was both informative and interesting and gave a wealth of instructive suggestions on organizational management, stressing particularly the need for a strict definition of supervisory responsibility and allocation of duties for personnel in any program of organization control.

The discussion period which followed was very extensive and indicated the interest created by Mr. Bonnycastle in his splendid address.

## MONTREAL CHAPTER

Montreal Chapter held their monthly meeting on December 6th, 1951, in the Vice-Regal Suite at the Ritz-Carlton Hotel.

The guest speaker was Mr. L. M. Clarke, assistant supervisor, Office Services Department, Sun Life Assurance Company. His subject was "Presenting Job Evaluation Plan to Clerical Employees".

Following the dinner, movie equipment and sound track were set up. A short feature cartoon with sound narration was exhibited, visually showing and describing the methods used to set up a Job Evaluation Plan.

Mr. Clarke followed this exhibit with a brief outline of what had been accomplished within his own company for the past several years. As he pointed out, despite the formidable title, Job Evaluation is comparatively simple when broken down to the major component sections of Training, Judgment, Contact and Working Condition requirements.

At the close of Mr. Clarke's address and illustrations, the speaker volunteered to answer questions. Members and their friends responded enthusiastically and judging by the lively question period that followed, the subject apparently had an element of good-natured controversy.

# NATIONAL CONFERENCE AND EQUIPMENT EXHIBIT NEWS

The Conference Committee has been at work for some time now on plans for our National Convention to be held at the Georgia Hotel, Vancouver, B.C., June 24th, 25th and 26th, 1952.

The B.C. Society is very proud of the opportunity to be host to the delegates from across Canada and everyone is busy thinking up ways to make your visit to the Pacific Coast a memorable one.

Information on the programme, technical sessions and entertainment, will be sent to you soon.

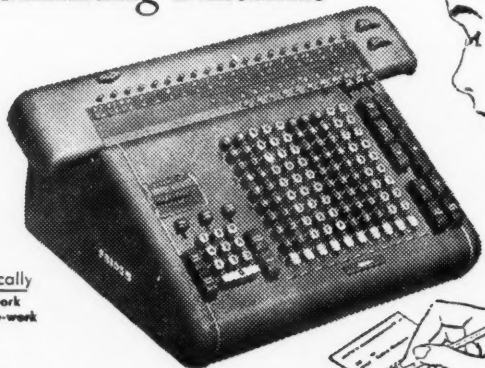
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## COST AND MANAGEMENT

# 11th Annual Ontario Cost Conference

May 29th, 30th and 31st

LONDON, ONTARIO

The London Chapter will be host to the 1952 Cost Conference and Annual Meeting of the Ontario Society on the above dates, at the Hotel London.

A real welcome awaits you at London and no effort is being spared by those in charge of this conference to make your visit both enjoyable and profitable.

The City of London is ideally situated for a conference. It is also a very beautiful city and in the month of May you will be able to see it in all of its Spring grandeur. Its beautiful parks, homes and tree-lined streets are well worth the visit in itself. There are many other attractions, too numerous to mention in this notice. Come and see them for yourself and have a good time while doing so.

The theme of the Conference this year will be:—

### CHALLENGING OPPORTUNITIES FOR THE INDUSTRIAL ACCOUNTANT

There will be three technical sessions. We have outstanding speakers — specialists in their respective fields of endeavour — and we feel sure that you will agree with our choice when you hear what they have to say.

1. How can the Industrial Accountant meet the problem of the shrinking margin of safety in business?
2. The role of the Industrial Accountant in maintaining a proper balance in business management.
3. Measurement of profits for Executive discussions.

Planning this Conference, for your enjoyment, is a large and serious undertaking and the London Chapter officers and members realize their responsibility. Every Chapter officer has a part to do and every member in Ontario can contribute to the success of the meeting by passing the word along. The following comprise the Conference Committee:—

*General Chairman* — Alex Moorhouse, Kellogg Company of Canada  
*Committee Chairmen* —

Publicity — Alex S. Magee, Dominion Manufacturers, Ltd.

Reception — C. E. (Ted) Costain, of Costain, Stiles & Langford, Ltd.

Reservations — Norman Duncan, John Labatt, Ltd.

Technical Sessions — Norman Barfoot, Fiberglas Canada, Ltd.

Programme — Millard P. McBain, Kellogg Company of Canada

Finance — Reg Diwell, Firestone Tire & Rubber Company, Ltd.

And, now, a word to the ladies. A very fine programme is being worked out just especially for you and we feel sure that you will enjoy every minute of your visit in London.

## ◆ C & M ROUND-UP ◆

### INDUSTRIAL DEVELOPMENT BANK

The annual report of the Industrial Development Bank has many interesting points.

Authorizations by groups of enterprises show that the chemical group received the most assistance, followed by wood products, foods and beverages and iron and steel products.

Total loaned during the past year was 15.7 millions, while number of current individual loans were 548 for a value of 45.2 millions.

Last year's statement showed a total of 489 authorizations for a value of 35.7 millions.

The general desirability of credit restraint in the defence economy and dwindling supplies of labor and materials made the bank discourage applications not likely to help the above situation.

Loans to industries connected with the defence effort were not many in number, but substantial in average amount.

Interest rates were raised from 5 to 5½ during the year.

The bank is performing a very worthwhile purpose which is amply demonstrated by the great number of small industrial enterprises which turn to it for assistance.

### EMIGRATION

With the large-scale immigration to Canada in the last few years, it may be of note to mention that in the last two years an average of 26,000 people have emigrated from this country. About 76% have gone to the United States and the balance mainly to the United Kingdom.

### DEFENCE CONTRACTS

In the first six months of 1951 the Canadian Commercial Corporation issued on behalf of the Department of National Defence 53,074 contracts, of which 80% (42,632) was on competitive bid and 11,072 on other bases.

Six types of purchase contracts are in use, and these are:—

1. *Fixed Price Contract*, with selection of contractor based on competitive tenders. This is first choice on contracts, and it's the basis on which most of the contracts are let.

2. *Negotiated Fixed Price Contract*, with selection of contractor either on the basis of cost estimates submitted by those contractors thought capable of undertaking the contract or, in some cases, with selection of contractor based purely on the Department's knowledge of potential suppliers.

3. *Ceiling Price Contract* subject to reduction to cost plus a fixed percentage. Where benefits of volume production cannot be determined accurately in advance, this type of contract has certain advantages.

4. *Target Price Plus Incentive Contract*, which results in payment to the contractor of actual costs ultimately determined by audit plus a fixed



## COST AND MANAGEMENT

fee, being a percentage of the target price, plus a bonus representing a percentage of the difference between the cost ultimately established by audit and the original target cost.

5. *Cost Plus Fixed Fee Contract* is preferable to the type of contract generally known as "cost plus", since increased costs do not mean increased profits or fees to the contractor.

6. *Cost Plus Contracts* which result in the contractor being rewarded by a fixed percentage of whatever his costs may be, are the least desirable, but sometimes inevitable; e.g., where it's not possible to estimate with any accuracy the size or complexity of the job.

## INCOME TAX — CANADA AND UNITED STATES

A study of comparative tax tables between the two countries shows that United States taxes start at a much lower level of income and are higher up to the \$7,500.00 per annum income in the single and married class. From there up the tax is progressively higher in Canada. On a straight comparison, married earner with dependents show higher taxes in Canada. However, when the family allowance of \$72.00 annually per child is taken off, taxes in Canada are lower in the low income group. Generally, taxes on the small earner are easier in Canada than the United States and higher in the middle and upper earning brackets.

## LABRADOR

Iron in Labrador is a familiar story but did you know that recent exploration teams have uncovered large deposits of copper, titanium, lead, zinc, graphite, nickel or mica?

There is a reputed 40 million cords of prime spruce available. Preliminary work on hydro electric power reveal falls on the Hamilton River capable of generating 2½ million horsepower.

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## PERSONALS

ROBERT K. ROY, R.I.A., formerly accountant and manager, has been appointed comptroller of Biltmore Hats Limited. Mr. Roy is chairman of the Kitchener Chapter and a member of the Ontario Educational Committee and Council of the Ontario Society.

GEORGE M. EGOFF has been appointed managing director, Sheldon's Limited. Mr. Egoft is a past chairman of the Kitchener Chapter.

**COST AND MANAGEMENT**  
**CURRENT ARTICLES OF INTEREST TO INDUSTRIAL ACCOUNTANTS**

**ACCOUNTING**

**ACCOUNTING AND ECONOMIC CONCEPTS** — The Australian Accountant, October 1951.

**BREAK-EVEN**

**METHODS AND POTENTIALITIES OF BREAK-EVEN ANALYSIS** — by Joel Dean, The Australian Accountant, October 1951.

**BUDGETS AND BUDGETING**

**SIMPLIFYING THE DETAIL SIDE OF EXPENSE CONTROL** — by H. C. Arnold, N.A.C.A. Bulletin, December 1951, Sec. 1.

**FORECAST BUDGETING FOR A MULTIPLANT OPERATION** — by W. J. Tagtmeier, N.A.C.A. Bulletin, December 1951, Sec. 1.

**PERFORMANCE BUDGETING IN MUNICIPAL GOVERNMENTS** — by A. W. Sykes, N.A.C.A. Bulletin, December 1951, Sec. 1.

**COST CONTROL**

**START WITH A SIMPLE COST CONTROL SYSTEM** — by James T. Duffy, Jr., Factory Management and Maintenance, December 1951.

**COST REDUCTION**

**CASES IN METHODS IMPROVEMENT, JACK & HEINTZ, INC. — 10 WAYS TO TRIM COSTS AND BOOST PROFITS** — Factory Management and Maintenance, December 1951.

**DIRECT COSTING**

**AN APPRAISAL OF DIRECT COSTING** — by John A. Beckett, N.A.C.A. Bulletin, December 1951, Sec. 1.

**DISTRIBUTION COSTS**

**DISTRIBUTION COST ANALYSIS — RETAIL, WHOLESALE AND MANUFACTURING** — United States Department of Commerce, Bureau of Foreign and Domestic Commerce.

**ECONOMICS**

**ACCOUNTING AND ECONOMIC CONCEPTS** — The Australian Accountant, October 1951.

**AN ECONOMICS FOR ADMINISTRATORS**—by Benjamin M. and Sylvia K. Selekmán, Harvard Business Review, November 1951.

**FINANCIAL STATEMENTS**

**PRESENTATION OF FINANCIAL STATEMENTS TO THE PUBLIC** — by Wilfred Ctempel, The Canadian Chartered Accountant, November 1951.

**FINANCIAL STATEMENTS FOR THE SMALLER COMPANY** — by R. W. Hamilton, The Canadian Chartered Accountant, November 1951.

**ANNUAL REPORTS FOR BANKS** — by Sherwood E. Bain, Harvard Business Review, November 1951.

## C. & M. ROUND-UP

### IDLE EQUIPMENT

THE COMPLEX PROBLEM OF IDLE MACHINE TIME — by C. D. Eldridge, N.A.C.A. Bulletin, December 1951, Sec. 1.

### INDUSTRIAL RELATIONS

KEEP SUPERIORS ABREAST OF MANAGEMENT'S THINKING — Factory Management and Maintenance, December 1951.

### INSURANCE

BUSINESS INTERRUPTION PROBLEMS IN COMPANY OPERATIONS TO-DAY — by Frank L. Erion, American Management Association, Insurance Series No. 91.

NEW FIELDS OF POTENTIAL LOSS — by Franklin J. Marryot, American Management Association, Insurance Series No. 91.

AN ANALYSIS OF MULTIPLE LOCATION PLANS — by Walter Sheldon, American Management Association, Insurance Series No. 91.

OPPORTUNITIES FOR THE CORPORATE INSURANCE DEPARTMENT — A PANEL SESSION — American Management Association, Insurance Series No. 91.

WAR DAMAGE CORPORATION AND ITS MEANING TO INSURANCE BUYERS — by Harry F. Perlet, American Management Association, Insurance Series No. 90.

INSURANCE NEEDS UNDER DEFENCE CONTRACTS — by William Leslie, American Management Association, Insurance Series No. 90.

IS YOUR CURRENT INSURANCE ADEQUATE? — A PANEL SESSION — American Management Association, Insurance Series No. 90.

THE IMPACT OF INFLATION ON THE INSURANCE INDUSTRY AND INSURANCE PRACTICES — by L. C. Irvine, American Management Association, Insurance Series No. 90.

### JOB EVALUATION

THE PROFILE METHOD OF HIGH-LEVEL JOB EVALUATION — by Edward N. Hay and Dale Purves, American Management Association.

### MANAGEMENT

PROBLEMS OF ADMINISTRATION IN A DEMOCRATIC SOCIETY — by Ordway Tead, American Management Association, General Management Series No. 152.

MANAGEMENT PLANNING — THE FINANCIAL VIEWPOINT — by John E. Kusik, American Management Association, General Management Series No. 152.

PERSPECTIVE ON THE CURRENT MANAGEMENT JOB — by John M. Hancock, American Management Association, General Management Series No. 153.

THE PRESIDENTS' ROUND TABLE — American Management Association, General Management Series No. 152.

THE MANAGEMENT IMPROVEMENT PROGRAM OF THE UNITED STATES DEPARTMENT OF DEFENCE — by General Joseph T. McNarney, American Management Association, General Management Series No. 153.

ECONOMIC AND LABOR RELATIONS FACTORS IN MANAGEMENT PLANNING — I. THE SETTING OF THE PROBLEM — by Murray Shields; II. CRITICAL ECONOMIC FACTORS AND THEIR EFFECT ON CURRENT MANAGEMENT PLANNING — by Roy Blough; III. COLLECTIVE BARGAINING IN A DEFENCE ECONOMY — by George W. Taylor, American Management Association, General Management Series No. 153.

## **COST AND MANAGEMENT**

### **MANUFACTURING EXPENSE**

**SIMPLIFYING THE DETAIL SIDE OF EXPENSE CONTROL** — by H. C. Arnold,  
N.A.C.A. Bulletin, December 1951, Sec. 1.

### **MECHANICAL EQUIPMENT**

**A PRODUCTION PLAN FOR PUNCH-CARD OPERATORS** — by H. S. Draper, The  
Controller, December 1951.

### **MUNICIPAL**

**PERFORMANCE BUDGETING IN MUNICIPAL GOVERNMENTS** — by A. W. Sykes,  
N.A.C.A. Bulletin, December 1951, Sec. 1.

### **OIL**

**SOME NOTES ON OIL PRODUCTION ACCOUNTING** — by Arthur Maw, The  
Canadian Chartered Accountant, November 1951.

### **OVERHEAD**

**THE ASSIGNMENT OF NON-MANUFACTURING COSTS TO TERRITORIES AND OTHER  
SEGMENTS** — N.A.C.A. Bulletin, December 1951, Sec. 3.

### **PRODUCTION CONTROL**

**PRODUCTION MANAGEMENT IS SERIOUS BUSINESS** — by Henry W. Hanley,  
N.A.C.A. Bulletin, December 1951, Sec. 1.

### **PROFITS**

**WHY PROFIT FIGURES ARE MISLEADING** — by E. Stewart Freeman, The Controller,  
December 1951.

### **QUALITY CONTROL**

**QUALITY CONTROL** — by Theodore H. Brown, Harvard Business Review, November  
1951.

### **REPORTS**

**INTERNAL BLUEPRINT — THE CONTROLLER REPORTS TO TOP MANAGEMENT** —  
by C. Aubrey Smith and Jim G. Ashburne, The Controller, December 1951.

**ANNUAL REPORTS FOR BANKS** — by Sherwood E. Bain, Harvard Business Review,  
November 1951.

### **RETAILING**

**COST ANALYSIS FOR THE RETAIL STORE — DISTRIBUTION COST ANALYSIS —  
UNITED STATES DEPARTMENT OF COMMERCE** — Bureau of Foreign and  
Domestic Commerce.

### **STANDARD COSTS AND COSTING**

**VALUE OF ESTABLISHING A SYSTEM OF STANDARD COSTS** — by Paul C. Taylor,  
C.P.A., The Journal of Accountancy, December 1951.

### **SUCCESSION DUTIES**

**THE PROVISIONS OF THE DOMINION SUCCESSION DUTY ACT** — by T. B. Nash, The  
Canadian Chartered Accountant, November 1951.

### **WHOLESALE**

**COST ANALYSIS FOR THE WHOLESALE — DISTRIBUTION COST ANALYSIS —  
UNITED STATES DEPARTMENT OF COMMERCE** — Bureau of Foreign and  
Domestic Commerce.

### **WORK SIMPLIFICATION**

**WORK SIMPLIFICATION METHODS TO SAVE TIME AND MONEY** — by Jay E.  
Robinson, C.P.A., The Journal of Accountancy, December 1951.

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# DITTO

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## **Economic Management of Inventories**

**By RAYMOND L. BOWLES,**

*Manager, Production Planning, Armstrong Cork Co.*

Once, in the pre-Christian era, the people began to construct a tower in the city of Babel in the land of Shinar. And you all know what happened to that legendary tower of Babel.

The Lord became angered with the people and caused them to speak different languages. The resulting confusion stopped construction of the tower.

Now as we approach this problem of economic control of inventory, we find just as much confusion — and it's the confusion that results from different languages.

All segments of management are speaking different languages when they refer to inventories. And they have different thoughts.

In this particular situation, accountants have played the part of the Lord — because you have helped create the confusion of language. How? Why, you have taught top management to think of inventories as a synonym for loss. You have allowed inventory accounting to become so involved that no one but a controller or an accountant can understand what it is all about. You have made it impossible for profits, derived from the use of inventories, to be credited to inventories, and yet it is seldom indeed that a modern business statement does not include a footnote explaining a loss resulting from inventories. Top management sails along during the year basing judgments on interim profit and loss statements which are based on standard costs for inventories and then, at the end of the year, find that when inventory values are corrected to the lower of cost, market or LIFO that the anticipated profit showing has been drastically changed. Is it any wonder that top management does not understand inventories, considers them in the light of a necessary evil, a potential source of loss, and that the only approach to the control of inventories is from the standpoint of keeping them at an absolute minimum?

What is the attitude of the operating departments toward inventories? The Sales Department, for instance: They, of course, want plenty of inventories. They want everything in

## ECONOMIC MANAGEMENT OF INVENTORIES

stock at all times, or, at least, want to be in a position of providing better than competitive service to their customers.

The Production Department wants plenty of raw materials in order to insure the maintenance of operations and will always want long runs scheduled for finished goods in order to attain top efficiencies.

The Purchasing Department wants to place orders for large quantities of raw materials well in advance of needs in order to secure the best possible discounts and to prevent the expense incurred from a close follow-up on suppliers.

The Engineering Department wants plenty of repair parts on hand to insure their ability to make quick repairs when the need arises.

It is fair to say that all direct operating departments are in favor of large inventory investments to give the maximum opportunity for creating additional sales, reducing costs, or, in other words, to increase profits. On the other hand, this desire for large inventories is not hampered by any fear of showing inventory losses to their individual functions since such losses are not charged directly to them.

This field is usually termed "Inventory Control". I would like to see it changed to "Inventory Management". My reason for doing this is because I believe that the word "management" is synonymous with the use of judgment, while the word "control" brings to mind some mechanical approach such as the various maximum and minimum plans widely used throughout Industry. I would like to take a little time to explain why I do not like such mechanical means for controlling inventories.

The majority of such plans are based on the assumption that someone in operating management will sit down at periodic intervals, such as once a quarter or once in six months, go over the inventory records and establish maximum and minimum quantities for each item. The minimum becomes the point at which new orders are to be placed either with a supplier or with the Production Department for specified quantities that will bring the inventory up to the maximum level. This sounds like a reasonable approach, *but* let's consider some of the assumptions upon which it is based.

It is assumed that this operating manager is well versed in inventory control and that he will have no particular bias in his approach to the problem. Yet, I have just pointed out that

## COST AND MANAGEMENT

most, if not all, operating departments essentially want large inventories.

It is assumed that this individual will take the necessary time at the intervals stated to divorce himself from his regular duties and actually sit down for the time required to truly study out the needs for each individual item. I have found many cases where the individual is possibly away on a business trip or busy on pressing matters concerned with his regular duties that leads him to postpone the job until some later date. In some cases that later date has actually turned out to be several years away.

Inventories are carried for future, not past, needs. The usual basis for the maximum and minimum levels established is an average of performance during some past period. My experience indicates that the past is only one indicator of what may be expected in the future, and that above all else, we can expect a change. Past experience should be used as only one of the factors for estimating the future.

It is assumed that when establishing a minimum that the time required to place an order with a supplier and secure delivery will be the same in the future as it has been in the past. Is it your experience that it takes as long to-day to secure delivery from your suppliers as it did a year ago? If you are automatically allowing the same time, are you not taking the risk of ordering farther in advance than need be for some items and laying yourself open for losses from price reductions, or not ordering far enough ahead for others and failing to receive your orders on time.

How about the maximum figure? Should we assume that the length of run should always be the same? Perhaps there is an opportunity to lengthen the run and increase efficiency, and perhaps we are getting indications that sales are falling for that particular item and we had better take a loss in efficiency and avoid later losses in inventory markdowns.

I believe that the maximum and minimum or mechanical approach typified by the words "control of inventories" is synonymous with poor inventory management. I believe there is no way that you can divorce proper management of inventories from judgment. Every time a purchase order is placed, every time a production order is placed, judgment should enter into the decision.



## ECONOMIC MANAGEMENT OF INVENTORIES

When we speak of judgment, we immediately think, is the problem of sufficient importance to warrant the cost of judgment? A recent report from the United States Department of Commerce indicates that business inventories at the end of 1948 totalled fifty-four billion dollars. Fifty-four billion dollars! That is a big investment! It compares with twenty billion dollars invested in inventories at the end of 1939. From the twenty billion dollars invested in inventories at the end of 1939, the business investment in inventories increased in nine years to fifty-four billion dollars. Six billion dollars of the increase occurred in 1948. Do you realize that this six billion dollars amounted to seventy-five percent of the investment in new manufacturing plant and equipment during 1948? We have all heard of the scarcity of capital available for the building of new plants and equipment. In spite of this scarcity, business invested seventy-five percent of the requirements for new plants and equipment, six billion dollars to increase inventories.

I think you will agree that this problem of management of inventories is important in the aggregate. The big problem, however, is how to apply management judgment to this tremendous inventory investment, but which depends upon hundreds, possibly thousands, of small decisions during the year for an individual business. Top management certainly does not have the time to make these small decisions. They should only be responsible for the establishment of an inventory policy which will be carried out by others or for particular decisions regarding major speculative materials.

The operating management not only does not have the time, but they also have a biased attitude that cannot fail to secure poor results. How, then, can the problem be handled? I will offer, for your consideration, three answers to this question.

The first answer lies very largely in the province of cost accountants. Something must be done to make top management realize that the inventory investment in their business should be carried for the purpose of making a profit. It should be made easy for them to understand how inventories can make a profit and how they do make a profit. Any inventory investment that cannot be justified on the basis of making a profit should be eliminated. What are these profit possibilities? I list them as four.

## COST AND MANAGEMENT

First — customer service. Every business should be in a position to provide competitive service to its customers. By this I do not necessarily mean the type of service requested by a Sales Department, but I do mean that the service should be as good or a little bit better than that provided by competitors. A whole lot better will very probably result in increases to costs that are not justified. Inventories that provide a means for giving true competitive service and by that means adding to the sales volume are certainly contributing a profit to the enterprise.

Increases to production efficiency are a second means of making a profit through the use of inventories. This can be done by insuring the maintenance of operations, providing long runs and reducing down-time from breakdowns or changes from one item to another. I have often thought that a production man's idea of paradise is to set up a machine to run one item and keep it running that one item forever. While it is seldom possible to approach this ideal, intelligent inventory management can improve the length of runs and provide the opportunity for substantial cost reductions. Stability of employment is another factor affecting efficiency that is becoming increasingly important.

A third way of improving profits is to use inventories to avoid expenditures for buildings and equipment—fixed capital expenditures, in other words. It is often the case that large expenditures for additional capacity requiring depreciation over a period of possibly twenty years can be avoided by a temporary use of working capital for inventories. For instance, some years ago an operation was producing for individual orders. There were frequent shutdowns for changes. Capacity was not sufficient to keep up with sales. The commodity was oversold three to four months in advance. Plans were under way for a considerable expenditure for capacity. Means were found to standardize the line and run to inventory. The Sales Department was asked to defer promise dates on new orders an additional month from the basis then in effect to provide time for the accumulation of a service inventory. The length of run was increased. Within ninety days the capacity of that operation was increased three hundred percent, labor costs were reduced approximately fifty percent, the need for a major capital investment was eliminated. This was an outstanding example

## ECONOMIC MANAGEMENT OF INVENTORIES

of how inventories can be used to add to the profits of an enterprise.

When one speaks of making a profit from the use of inventories, it is usual to think of speculation. I do not consider this a major reason for justifying an inventory investment. Of course, all inventories must be managed with real judgment in respect to the possibilities of increased or reduced costs in the future. Every businessman must be a speculator to a considerable extent, whether from the standpoint of a fixed investment or an inventory investment. It, at least, should be easier to estimate the opportunities for a profit or a loss from a short term inventory investment than from a long term investment in plant and equipment. Some managers believe they have eliminated the risk of speculation from inventories when they establish an arbitrary inventory formula such as the maintenance of a fixed inventory in relation to usage or sales. Supposing, in the operation of this method, they state that an inventory should always be carried on the basis of a two-month supply. For some reason this is conceived to be the amount needed to properly service the business. Such a policy will inevitably lead, over the years, to a net loss on inventories. When volumes are high, which in most cases means that prices are also high, a two-month inventory represents a much greater investment than when volumes and prices are low. When prices go down, the loss on the large inventory volume will be greater than the opportunity for profit on the volume carried at a low rate of sale. Intelligent inventory management will consider it necessary to reduce inventories below the average level when volumes are high, thereby minimizing any potential loss from a drop in prices and will increase inventories above the average level when prices are low, providing an opportunity for increased profits when volumes and prices increase.

There are ways of making profits from inventories even though they are not shown on a company statement. They can be summarized as being (1) service, (2) efficiency, (3) minimizing capital investment, and (4) speculation.

The second requirement for economic management of inventories is centralized responsibility. Some one individual or department within the company must be given the responsibility for properly managing the inventory investment. In order to carry out the responsibility, this individual must have the

## COST AND MANAGEMENT

confidence of management. He will follow policies laid down by management which will be based upon their judgment concerning the future trend of business and costs. He will have the responsibility of interpreting these policies to the various operating divisions and for seeing that they are carried out. He will take part in establishing the sales forecasts and the production plans for the commodities sold. He will have access to information that will indicate how well these forecasts are being followed and will have the privilege of discounting sales optimism when, in his judgment, such action is necessary. He will be familiar with the manufacturing processes and know where the best opportunities lie for increasing profits by the use of inventories and to know where and when the investment is excessive for the results secured. He must be well grounded in accepted inventory accounting practices and understand how the results of his work will affect the profit and loss report. Above all else, he must keep an unbiased attitude and must truly manage inventories from the standpoint of the company as a whole rather than as a member of any operating division.

The third need for economic management of inventories is proper personnel to make the hundreds and thousands of individual decisions on a day-by-day basis. It is the Inventory Manager's responsibility to see that adequate personnel, well trained in inventory management procedures and theory, is organized to actually handle the work within the operating departments. This personnel must have access to the proper information that will enable them to discharge their responsibilities. This may be forecasts of sales, it may be rates of production, operation capacities, unit sales. Above all else, they must be provided with accurate up-to-date information from the Controller's Department regarding the actual inventories by items and the actual usage or sales. They must work closely with the Purchasing Department to know the trend of prices, economic order quantities and the delivery times required by suppliers. With all this information available, they must be the type and calibre of persons that can exercise judgment.

To summarize, the approach to solving the problem of economic management of inventories is three-fold: (1) a proper attitude and understanding on the part of top management; (2) centralized responsibility for inventory management; (3) proper personnel that can exercise judgment.

## Management of Tomorrow's Business Today

By C. B. TAYLOR, R.I.A.

### Introduction

Before I proceed to the main core of my subject there are three things I would like to touch on briefly by way of preliminary. They are: Our society, our profession and business generally.

My own connection with this society of ours goes back to its very early days — to a time when a handful of cost men in Hamilton and Toronto became an affiliate of the National Association in the States. At that time, since I was located in Chatham, it was my privilege as a fledgling cost man to attend lectures in Detroit. I heard talks by top men in the game — many, many of them, and if I can in some small way to-night repay for the many interesting subjects which contributed so much to me in those early days, by such men, men devoted to the society, I shall feel amply repaid.

That those who originally conceived the Canadian Society of Industrial and Cost Accountants could envisage our present status, is very much to be doubted. Here we are about thirty years later, a society dominion-wide, with private bills in all ten provinces, with accompanying degree rights, with twenty-nine active chapters, and a membership of over three thousand. We should all be proud of the progress of our society.

But, let's go on — let's examine what has taken place over that same period in our profession. Along in the late twenties we began to hear and read about standard costs. This was perhaps the most significant single step in the cost accounting field. It gave us for the first time the principle of a normal — a measuring stick against which we could assess actual accomplishment. No longer was the cost man told he was crazy when, in costing a  $\frac{3}{4}$  x 6 bolt, his figure was \$1.96 in January and \$2.17 in February. He always felt he knew the reason, but he could not convince anyone else that he did. Here was a forward and far-reaching step in our field which provided the answer in a way anyone could understand.

And next — and related thereto — came budgets. First the fixed budget and later the flexible budget, often called variable

An Address before the Ottawa Chapter.

## COST AND MANAGEMENT

or selective. We were told that any business which tried to operate without a budget would soon wither and die. Suffice to say that here again we use the principle of normal or anticipated result against which to measure accomplishment.

Soon following these developments came the profit graph or profit projection, as we choose to call it. This was the brain child of an American engineer, C. E. Knoeppel and his first thesis appeared in the late twenties. His first published volume "Managing for Profit" appeared, in first edition, about 1934, and in my opinion this book belongs in the library of every cost accountant. Here we have the basic concept of standards, and of budgets, in easily understood diagramatic form.

### A Company and Its Problems

In approaching the subject of this talk, we wish to portray the experience of one company, which company through lack of a comprehensive knowledge of its break-even point, had over a period of five years lost many thousands of dollars that it might otherwise have retained.

We cannot, of course, disclose the name of this company, nor do we propose to indicate the nature of its business. On the other hand, we can say to you — that the technique we are shortly to exhibit to you — can be applied to your specific business. The mechanics are the same in any business and while sales, fixed load, and profit margins, may vary, the principles we will indicate are highly pertinent. *The charting of a break-even point is the one effective method of determining for any business the effect of volume on profit.*

It should be pointed out that while basically this is an accounting subject, one which however has a strong flavour of engineering, we speak to you not only as accountants. We are going to refer to the subject also from a top management point-of-view. The fact is that many at top management level to-day recognize this tool as a highly significant and useful one — vital to their businesses.

Whether a job of this sort is done by your own personnel or by others, whether by your accounting personnel or your engineers, the significant ingredients for the task are: analytical ability, perspective, persistence. To the extent that the basic data is accumulated with these things in mind, so then will the ultimate graphs truly reflect the business to which they apply.

## MANAGEMENT OF TOMORROW'S BUSINESS TODAY

This, we think, is sufficient of a preliminary to now introduce a case history of a business that has been operating for many years, is well-established, well-regarded in the trade, has a modern plant equipped to a point beyond some of its competitors; but a business, nevertheless, which in large degree from a management point-of-view was running itself.

In attempting to establish a reasonable profit standard for this company, a review was made of five years of operation. Three of those five years were found to be reasonably normal from a profit point-of-view — the other two years were so far off as to give rise to serious question.

### Finding the Break-even Point

The core of our subject lies in the break-even point of a business — and the control of it. Since the break-even point of a business cannot be disclosed by the ordinary profit and loss statement, it is necessary that we adopt an altogether different form of "profit and loss" to determine it. Let us start, however, with the ordinary form and then translate it for our particular purpose. The statement for the first year as submitted by the company is reproduced in Fig. 1.

Our next step is to recast this statement to bring all our fixed costs together — in short, to isolate fixed costs from variable costs. Now this procedure requires considerable care, Since certain costs of operation are a composition of fixed and variable elements, such costs must be broken down. As examples, the telephone account is partially fixed and partially variable. The usual power account involving a service charge is another. Having completed such studies, however, it is now possible to recast our company statement to what appears in Fig. 2.

The next step is where the engineering approach is used. With the data from Fig. 2 we can now proceed to lay out a profit projection as in Fig. 3. Let us examine briefly its construction.

At the left margin is a dollar scale of sales volume from nil to maximum plant capacity at to-day's level of prices. It is not difficult to establish physical plant capacity by conference with management and a bit of study. Similarly, across the bottom we have a related scale, stated in percentage of physical capacity. Let us now plot in a "sales line" from extreme lower left (shutdown position) to extreme upper right (maximum

# COST AND MANAGEMENT

Fig. 1

## PROFIT AND LOSS

### First Year

(as submitted by the company)

Sales .....	\$737,936
Manufacturing Expense	
Materials .....	\$212,156
Wages .....	264,577
Fuel, Light and Power .....	30,405
Manufacturing Supplies .....	45,060
Taxes and Insurance .....	14,605
	<hr/> \$566,803
Gross Profit .....	\$171,133
Selling Expense	
Advertising .....	\$ 21,589
Salesmen's Salaries and Expense .....	31,726
Sales — Office Expense .....	6,042
Sales — Office Salaries .....	8,175
	<hr/> \$ 67,532
Administrative Expense	
Administrative Salaries .....	\$ 8,630
Administrative Expense .....	7,849
Office Salaries .....	4,681
Office Expense .....	15,211
	<hr/> \$ 36,371
Financial Expense	
Interest charges .....	\$ 9,224
	<hr/> \$113,127
Net Profit before Depreciation .....	\$ 58,006
Depreciation .....	53,682
	<hr/>
Net Profit .....	\$ 4,324

capacity). Our next step is to locate our first year sales position on this sales line. Fig. 2 states this at \$737,936. Using the dollar scale at the left of Fig. 3, this volume is located and followed horizontally to our sales line. At the point of intersection a vertical solid line is plotted. This is our "volume" line, shown at "V".

Having reached this point, it is a simple matter to plot in our cost elements on line "V" from the figures stated in Fig. 2 working from the bottom up, i.e., Material — \$212,156; Labour — \$175,260; Factory Variable Expense — \$69,182; etc. A line is drawn for each element, beginning at the extreme bottom left, intersecting the various points on line "V" and extending



# MANAGEMENT OF TOMORROW'S BUSINESS TODAY

Fig. 2

## First Year

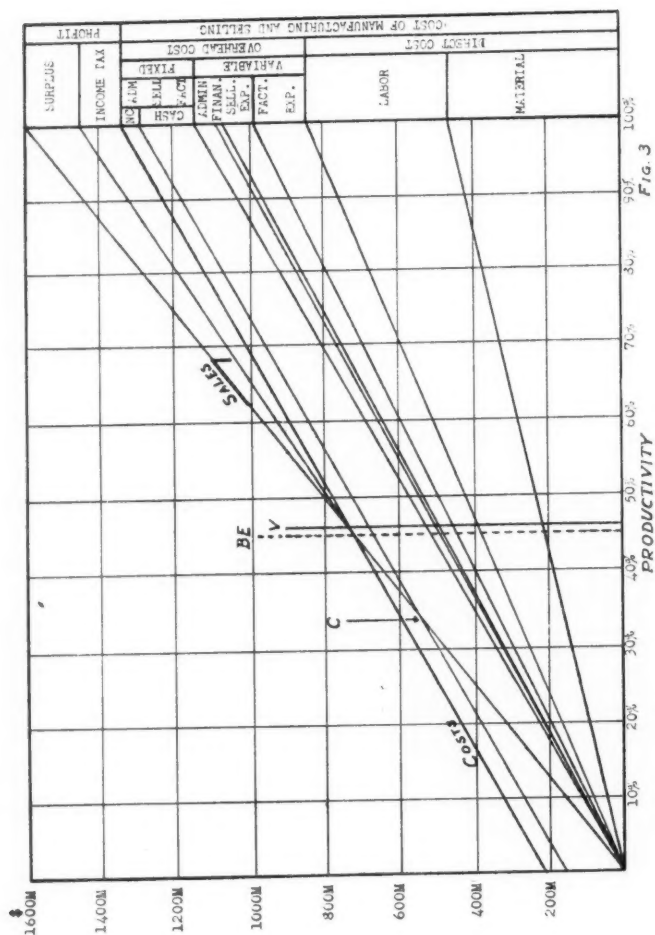
Sales .....	\$737,936
Net Profit .....	4,324
<hr/>	
Total Costs .....	\$733,612
Fixed Costs	
Depreciation .....	\$ 53,682
Administrative .....	13,311
Financial .....	—0—
Selling .....	30,635
Factory .....	110,205
<hr/>	
	\$207,833
Variable Costs	
Administrative .....	\$ 23,060
Financial .....	9,224
Selling .....	36,897
Factory .....	69,182
Direct Labor .....	175,260
Material .....	212,156
<hr/>	
	\$525,779
<hr/>	
Total Costs .....	\$733,612

Fig. 5

			Break-even	Projected
Year	Sales	Profit	Point	Profit on
A	\$ 737,936	\$ 4,324	\$ 720,000	Year A
B	649,246		670,000	\$ 4,324
C	675,809		750,000	
D	844,603	26,012	740,000	37,000
E	1,007,548	24,743	910,000	80,000
Total	\$3,915,142	\$ 33,565	\$3,790,000	\$ 83,324

to the extreme right. Since these are variable costs, the lines began at "nil" at the left, intersect our "volume line" at the stated figure and are "projected" to the extreme right. Fixed costs are bulked at \$207,833, and being *fixed regardless of volume*, are plotted at this figure right across the chart, left, centre, and right. A further division is made of cash and non-cash fixed expense, i.e., depreciation is isolated. By so doing we focus attention to another intersection — that point in sales volume where our loss is equal to depreciation only — where we are not losing cash. This we call the "critical" point, and it is labelled "C".

# COST AND MANAGEMENT



# MANAGEMENT OF TOMORROW'S BUSINESS TODAY

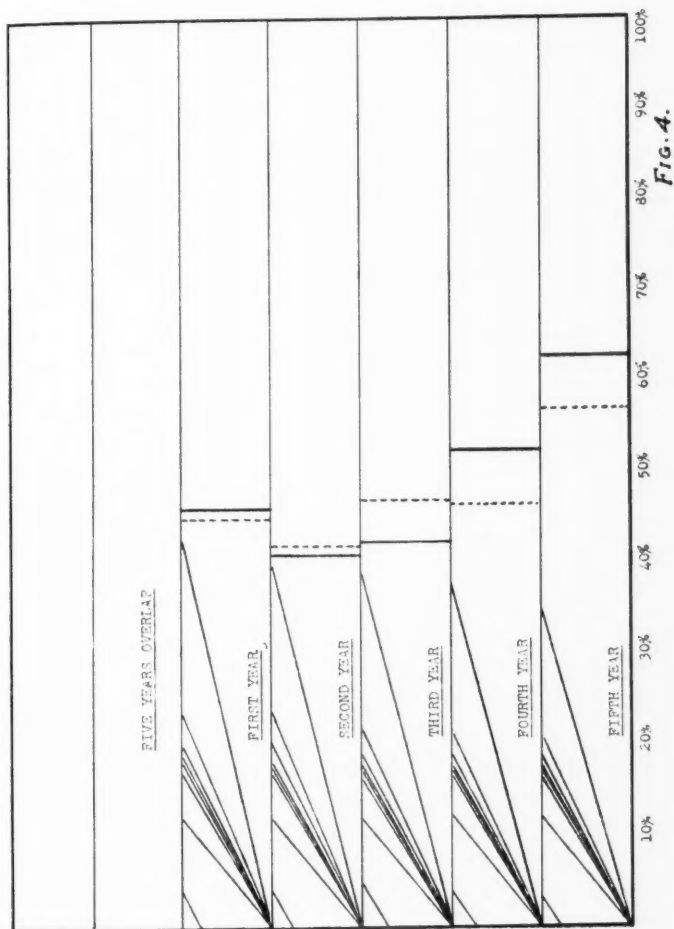


Fig. 4.

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The next step is to plot a vertical dotted line (B-E) at the "break-even" point — see Fig. 3. Finally, income tax is shown as a portion of profit beginning at the break-even point and extending to the extreme right.

Some of you have undoubtedly wondered at our construction of the graph in the manner originally conceived by Knoeppel. You may be more familiar with that which locates "fixed costs" in an area across the bottom. It should be remembered that we are dealing with a sick company. Under such circumstances the "critical point", shown at "C" is highly significant. This can be developed by using the present type of diagram but it cannot where "fixed load" appears across the bottom of the graph.

So much for the mechanics of Fig. 3. Now let's see what we can do with it.

### Information Revealed by a Break-even Chart

If our break-even point has been held to about its same position throughout the five years, it should be possible to read directly from the graph the profit result at any volume level. To illustrate — at \$1,000,000 profit (before taxes) should be \$80,000; at \$1,600,000 — \$253,000.

But, that is not what happened. In the fifth year we examined, volume was a little over a million dollars, but profit was less than \$25,000. Here is real evidence of what a shifting break-even point can do to a business.

Fig. 4 illustrates partial graphs of each of the five years. Take a look at the shift in break-even points. The solid vertical lines are the volume lines, the dotted vertical lines are the "break-even" lines. Note that the first, third, and fourth years are in about the same break-even position. The second year was one of retrenchment, volume dropped off seriously, the break-even point dropped back also, but a loss resulted. In the third year volume improved slightly, but our break-even line came right back, even past its former position, resulting in a greater loss than in the second year. The fourth year reflects sound operation, the break-even point being held with a considerable advance in volume, resulting in normal profit. But let's take a look at the fifth year. Volume improved substantially, but the break-even line also took a similar substantial move to the right. Result, the company's profit was only a fraction of what it

## MANAGEMENT OF TOMORROW'S BUSINESS TODAY

should have been. On this increased volume (about 20%) profit was less than the year before.

The result of our studies was to confirm that the first year chosen was in fact a reasonable standard of operation. The break-even position of that year was supported by the third and fourth years as shown in Fig. 4. From a control point-of-view the second year was even better than the first, but the fifth year reflects reaching for volume without regard for profit.

Let's take another look at Fig. 3. You've all heard of the smart guy who says: "Drop your prices 5% and it'll get you 10% more volume." Here we can get a direct answer to that one. Let's say we are at \$1,000,000, profit at that volume is \$80,000 before taxes. Now let's go up the 10% — result \$1,100,000, with profit of \$108,400. Now let's drop our prices 5%, or \$55,000. Resulting profit \$53,400. Such thinking will cost you \$26,600 in profit. The answer is right there on the chart.

### Use of the Break-even Chart in Setting Business Policy

Charts such as these serve management in a number of useful ways, predominantly in planning operation and in checking performance. As an aid in determining policy and general management strategy, the chart serves top management. As a tool of expense control it serves to keep middle management informed about its performance record and the areas in which that record may be improved. To serve the latter function it does, of course, require reference to detail underlying its construction, which detail is readily available.

Care must be exercised in checking operating results to the profitgraph where a shift takes place in product mix, particularly where profit margins on some products vary widely with others.

The profit graph provides management with the answers to these types of questions: How much volume can be lost before profits disappear? How much will profit increase with an increase in volume? What are the relative profit possibilities of two or more companies having similar sales volume?

Since it reflects so well the effect of volume on profit, and since price usually ties in with volume it is of great assistance in determining sound price policy.

## COST AND MANAGEMENT

We have known of where it has been used in negotiating wage contracts. Labour's demands were such that the company simply could not afford to meet them and the competitive situation was such that the company could not, by itself, increase the level of the prices of its goods. The margin wasn't there and the contract was negotiated much more readily by a true portrayal of that fact.

It will help you to search out and determine and appraise proper distribution policy. It will tell you whether or not you can afford to spend this or that sum with the possibility of acquiring this or that volume. It will tell you what the effect is in advance of the decision.

We have seen it used by companies with plant expansion in mind. There are many uses.

In closing, however, we want to stress two points — we'll leave them with you and hope that you will think about them. First, break-even points generally, in the post-war period, are definitely higher than those of the pre-war period. We have gradually stepped up to a *high-level economy* characterized by *high-gross income* — *high costs* — *high profits* — *high break-even point* — *low margins of safety*. Get that last one — low margins of safety.

The astute business manager to-day will do everything possible to get his house in order — and keep it that way. Certain it is that from every conceivable direction forces are at play, narrowing the margin of safety in industrial enterprise.

The chief executive of a business is often likened to the captain of a ship. I would remind you that the skipper of the lowliest cargo vessel is to-day equipped in a manner altogether different to ten years ago. He now has two-way ship-to-shore communication; he has his direction finder so that he may know his exact position at all times; he has his radar to throw up on a screen any obstruction in his path.

Business to-day, needs such equipment to meet new and changing conditions in a new and changed economy. We have illustrated to you one such piece of equipment, a management tool of high relative value — in much too limited use.

## COST AND MANAGEMENT

# « STUDENT SECTION »

### ADVANCED COST ACCOUNTING

Comments by

A. V. HARRIS, C.A., R.I.A.

### PAPER NO. 2

#### QUESTION 4 (14 Marks)

The XYZ Manufacturing Company operates a factory ledger for its cost data. On January 1st, the factory ledger trial balance showed:—

Raw Materials:

8,000 lbs. Material No. 1 x standard cost	
of 14c .....	\$ 1,120.00
6,000 lbs. Material No. 2 x standard cost	
of 30c .....	1,800.00
Material Price variation — Material No. 1 .....	80.00
Material Price variation — Material No. 2 .....	120.00
Work-in-Process at Standard .....	8,000.00
Finished Goods at Standard .....	6,000.00
General Ledger Control .....	\$ 17,120.00
	\$ 17,120.00      \$ 17,120.00

During the month of January, the following transactions occurred:—

1. Purchases on account 10,000 pounds of Material No. 1, standard cost per lb. 14c, actual cost \$1,600.00; and 7,000 pounds of Material No. 2 at standard cost per lb. 30c, actual cost \$2,310.00.

2. Materials used (assuming first-in, first-out method of inventory):—

	Issuance
Standard Quantity of No. 1 .....	12,000 lbs.
Actual Quantity of No. 1 .....	12,400 lbs.
Standard Quantity of No. 2 .....	8,000 lbs.
Actual Quantity of No. 2 .....	7,600 lbs.
Direct labour costs: Actual hours 8,000 .....	\$8,500.00

Standard hours for this work called for 8,200 hours at \$1.00 each.

Manufacturing expenses were applied on labour hours basis. Consider the following data:—

	Budget	Actual
Hours .....	8,400 hrs.	8,000 hrs.
Expenses .....	\$16,800.00	\$16,200.00

There was no work-in-process inventory January 31st; 80% of all manufactured goods were sold.

**REQUIRED:—**

Record transactions in journal entry form — using as many variances as possible. Do not close the variance accounts.

# COST AND MANAGEMENT

## SOLUTION

### QUESTION 4

Materials .....	\$ 1,400	
Materials — Price Variation .....	200	
General Ledger .....		\$ 1,600
Materials .....	2,100	
Material — Price Variation .....	210	
General Ledger .....		2,310
Work-in-Process — Material .....	1,680	
Material Quantity — Variation .....	56	
Materials .....		1,736
Work-in-Process — Material .....	2,400	
Material Quantity Variation .....		120
Material .....		2,280
Direct Labor .....	8,000	
Labor Price Variation .....	500	
General Ledger .....		8,500
Work-in-Process — Labor .....	8,200	
Labor Efficiency Variation .....		200
Direct Labor .....		8,000
Manufacturing Expenses .....	16,200	
General Ledger .....		16,200
Work-in-Process — Mfg. Expenses .....	16,400	
Mfg. Expenses Efficiency Variation .....		400
Mfg. Expense Applied .....		16,000
Mfg. Expenses Applied .....	16,000	
Idle Capacity Variation .....	800	
Budget Mfg. Expenses Variation .....		600
Manufacturing Expenses .....		16,200
Finished Goods .....	36,680	
Work-in-Process January 1st .....		8,000
Work-in-Process — Material .....		4,080
Work-in-Process — Labor .....		8,200
Work-in-Process — Mfg. Expenses .....		16,400
General Ledger .....	34,144	
Finished Goods .....		34,144

## COMMENTS

This problem was not difficult — but an error in the problem provided some possible variations. The problem was intended to read in the opening trial balance: Raw Materials — 6,000 lb. Material No. 2 x standard cost of .30c (not at .40c). If students did not check the arithmetic, they used the .40c rate with correspondingly greater Material variances. Credit was given by the examiner for their set of figures.



